THE IMPORTANCE OF THE Rh FACTOR IN MENTAL DEFICIENCY

*A Preliminary Report**

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APPROXIMATELY 30 per cent of admissions to institutions for mental defectives cannot be classified etiologically on the basis of our present knowledge. This, so-called, undifferentiated group represents a distinct challenge for medical investigation. The recent discovery of the Rh factor[1] and the demonstration of its importance in producing a characteristic type of fetal injury, namely, erythroblastosis fetalis[2] may be of importance in this respect. The possible relationship of Rh iso-immunization and certain types of mental deficiency is best described by the following brief review.

Some years ago we reported the pathological changes in the brain of infants who had died as a result of icterus gravis.[3] This pathological condition, known as Kernicterus, included widespread ganglion cell injury in the cerebral cortex, cerebellum, basal ganglia as well as other structures. Later, we reported the clinical picture of children who had recovered from icterus gravis but subsequently exhibited evidence of central nervous system injury. This included severe mental deficiency, extra-pyramidal spasticity and athetosis. An autopsy on one of these children confirmed the relationship of the cerebral changes originally described as Kernicterus and the above mentioned clinical picture.[4] At that time the etiology of icterus gravis was unknown. Beginning with the clinical studies of Diamond, Blackfan and Baty,[5] it was demonstrated that icterus gravis represented one manifestation of the syndrome erythroblastosis fetalis. In 1941, Levine and his co-workers[2, 6, 7] clearly indicated the importance of Rh iso-immunization in the etiology of erythroblastosis fetalis. Since Kernicterus is found primarily in children with erythroblastosis, it would appear reasonably well established

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that the pathogenesis of the cerebral changes in this condition was in some way related to the Rh factor. At present, therefore, one may justifiably implicate Rh iso-immunization as the etiological mechanism in individuals with the following characteristics: (1) mother, Rh negative; (2) patient, Rh positive; (3) neonatal history of erythroblastosis fetalis; (4) evidence of basal ganglion disease; (5) severe mental deficiency. However, if this syndrome were the only manifestation of Rh iso-immunization, it would play a very insignificant role in the over-all picture of mental deficiency. Thus, at the Southbury Training School for Mental Defectives only one child was admitted with all these characteristics, among 1200 total admissions. There are, however, certain observations that suggest that Rh iso-immunization may play an etiological role in cases where basal ganglion disease is not manifested, and where a history of neonatal erythroblastosis is not obtained. These observations are of two types. In certain of the autopsied cases showing Kernicterus, the clinical picture was not characteristic of erythroblastosis fetalis, in that the blood examination was not considered abnormal, and the jaundice was minimal. Also, we have recently encountered patients with typical familial and clinical histories of erythroblastosis fetalis whose neurological disorder was essentially that of cerebellar dysfunction rather than basal ganglion defect. Similar discrepancies have been recorded in the literature.[3,4] On the basis of these considerations there exists the possibility that certain of the imbecile and idiot defectives, now so unsatisfactorily classified as undifferentiated, may be etiologically explained as probable results of Rh iso-immunization.

Fortunately, this hypothesis lends itself to investigative confirmation. In a random sampling one would expect to find from 13 to 15 per cent of individuals, Rh negative. If a significantly greater proportion of mothers of an unselected group of undifferentiated defectives were found to be Rh negative, it might reasonably be deduced that in at least a number of these defectives, the mechanism of Rh iso-immunization was of etiological importance. In a preliminary survey, the incidence of Rh negative mothers of an unselected group of undifferentiated mental defectives was found to be approximately 25 per cent. On the other hand, among an equal number of mothers of mongolians, diplegics, microcephalics, etc., the incidence of Rh negative blood was in the normally expected range of about 12 per cent. While the total

number examined to date (approximately 100) is too small to draw definite conclusions, the difference between the two groups is statistically significant. The results are of sufficient interest to warrant further study.

While the demonstration of an Rh negative mother of an Rh positive mental defective does not make the diagnosis of fetal central nervous system injury due to maternal Rh iso-immunization, it does indicate the group in which this is a distinct possibility. Further clinical study of a large group of this type, may eventually result in a clinical characterization for which the blood studies may have confirmatory value.

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